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[illegible]

(2) 49
(3) 57
(4) 86

HISTORY : Detailed Current Edit History
DECLARATIONS
MTH\$CGEXP - perform G COMPLEX*16 exponentiation

```

0000 1      .TITLE  MTH$CGEXP      G COMPLEX*16 Exponential
0000 2      .IDENT  /1-002/      ; File: MTHCGEXP.MAR Edit: SBL1002
0000 3
0000 4
0000 5 *****
0000 6 *
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0000 24 *
0000 25 *
0000 26 *****
0000 27
0000 28
0000 29 FACILITY: MATH LIBRARY
0000 30 ++
0000 31 ABSTRACT:
0000 32      Perform G COMPLEX*16 exponentiation: e**(r,i)
0000 33
0000 34
0000 35 --
0000 36
0000 37 VERSION: 1
0000 38
0000 39 HISTORY:
0000 40
0000 41 AUTHOR:
0000 42      Steven B. Lionel, 20-July-1979
0000 43
0000 44 MODIFIED BY:
0000 45
0000 46
0000 47

```

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MTH\$CGEXP
1-002

N 3
G COMPLEX*16 Exponential
HISTORY ; DetaileG Current Edit History 16-SEP-1984 01:08:57 VAX/VMS Macro V04-00 Page 2
6-SEP-1984 11:21:03 [MTHRTL.SRC]MTHCGEXP.MAR;1 (2)

0000 49 .SBTTL HISTORY ; DetaileG Current Edit History
0000 50
0000 51
0000 52 : Edit History
0000 53 :
0000 54 : 1-001 - Adapted from MTH\$CEXP version 1-002. SBL 20-July-1979
0000 55 : 1-002 - Use MTH\$GEXP_R6. SBL 14-Dec-1979

**F

```
0000 57      .SBTTL  DECLARATIONS
0000 58
0000 59 :
0000 60 : INCLUDE FILES:
0000 61 :
0000 62 :
0000 63 :
0000 64 : EXTERNAL SYMBOLS:
0000 65      .DSABL  GBL
0000 66      .EXTRN  MTH$GSIN_R7
0000 67      .EXTRN  MTH$GCOS_R7
0000 68      .EXTRN  MTH$GEXP_R6
0000 69
0000 70 :
0000 71 : MACROS:
0000 72 :     NONE
0000 73 :
0000 74 :
0000 75 : PSECT DECLARATIONS:
0000 76      .PSECT  _MTH$CODE      PIC, SHR, LONG, EXE, NOWRT
0000 77
0000 78 :
0000 79 : EQUATED SYMBOLS:
0000 80 :
0000 81 :
0000 82 :
0000 83 : OWN STORAGE:
0000 84 :     NONE
```

```
0000 86 .SBTTL MTH$CGEXP - perform G COMPLEX*16 exponentiation
0000 87
0000 88 :++
0000 89 : FUNCTIONAL DESCRIPTION:
0000 90
0000 91 : The result of the operation e ** (r, i) is computed
0000 92 : by:
0000 93
0000 94 : result = (EXP(r) * COS(i), EXP(r) * SIN(i))
0000 95
0000 96 : CALLING SEQUENCE:
0000 97 : CALL MTH$CGEXP (result.wgc.r, arg.rgc.r)
0000 98
0000 99
0000 100 : INPUT PARAMETERS:
0000 101 : arg = 8 ; G COMPLEX*16 argument by reference
0000 102
0000 103 : IMPLICIT INPUTS:
0000 104 : NONE
0000 105
0000 106 : OUTPUT PARAMETERS:
0000 107 : result = 4 ; G COMPLEX*16 result by reference
0000 108
0000 109 : IMPLICIT OUTPUTS:
0000 110 : NONE
0000 111
0000 112 : COMPLETION CODES:
0000 113 : NONE
0000 114
0000 115 : SIDE EFFECTS:
0000 116 : Signals: MTH$ SINSIGLOS if !ii > 2*PI*2**31.
0000 117 : Floating Overflow if r > 88.028
0000 118
0000 119 :--
0000 120
0000 121
00FC 0000 122 .ENTRY MTH$CGEXP, ^M<R2,R3,R4,R5,R6,R7>
0002 123 MTH$FLAG_JACKET ; resignal
0002
6D 00000000'GF 9E 0002 MOVAB G^MTH$$JACKET_HND, (FP)
0009 ; set handler address to jacket
0009 ; handler
0009
0009 124
50 08 BC 7D 0009 125 MOVQ @arg(AP), R0 ; R0-R1 = real part
00000000'EF 16 000D 126 JSB MTH$GEXP R6 ; R0-R1 = EXP(r)
7E 50 7D 0013 127 MOVQ R0, -(SP) ; Save it on the stack
0016 128
50 08 AC D0 0016 129 MOVL arg(AP), R0 ; R0 is address of arg
001A 130
50 08 A0 7D 001A 131 MOVQ 8(R0), R0 ; R0-R1 = imaginary part
7E 50 7D 001E 132 MOVQ R0, -(SP) ; Save imaginary part
00000000'EF 16 0021 133 JSB MTH$GCOS R7 ; R0-R1 = COS(i)
04 BC 08 AE 50 45FD 0027 134 MULG3 R0, 8(SPT), @result(AP) ; Store real part
50 8E 7D 002E 135 MOVQ (SP)+, R0 ; Get imaginary part again
00000000'EF 16 0031 136 JSB MTH$GSIN R7 ; R0-R1 = SIN(i)
52 04 AC D0 0037 137 MOVL result(AP), R2 ; Address of result
```

MTHSCGEXP
1-002

G COMPLEX*16 Exponential
MTHSCGEXP - perform G COMPLEX*16 exponen

D 4

16-SEP-1984 01:08:57 VAX/VMS Macro V04-00
6-SEP-1984 11:21:03 [MTHRTL.SRC]MTHCGEXP.MAR;1

Page 5
(4)

08 A2 8E 50 45FD 0038 138 MULG3 R0, (SP)+, 8(R2) ; Store imaginary part
04 0041 139 RET
0042 140
0042 141
0042 142 .END

MTHS
1-00

ARG = 00000008
MTH\$\$JACKET_HND ***** X 01
MTH\$CGEXP 00000000 RG 01
MTH\$GCOS_R7 ***** X 00
MTH\$GEXP_R6 ***** X 00
MTH\$GSIN_R7 ***** X 00
RESULT = 00000004

+-----+
! Psect synopsis !
+-----+

PSECT name	Allocation	PSECT No.	Attributes
ABS	00000000 (0.)	00 (0.)	NOPIC USR CON
MTH\$CODE	00000042 (66.)	01 (1.)	PIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE

+-----+
! Performance indicators !
+-----+

Phase	Page faults	CPU Time	Elapsed Time
Initialization	29	00:00:00.07	00:00:01.02
Command processing	135	00:00:00.68	00:00:05.80
Pass 1	77	00:00:00.69	00:00:04.38
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	40	00:00:00.48	00:00:01.93
Symbol table output	2	00:00:00.01	00:00:00.01
Psect synopsis output	2	00:00:00.02	00:00:00.02
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	287	00:00:01.97	00:00:13.18

The working set limit was 900 pages.
2344 bytes (5 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 7 non-local and 0 local symbols.
202 source lines were read in Pass 1, producing 11 object records in Pass 2.
1 page of virtual memory was used to define 1 macro.

+-----+
! Macro library statistics !
+-----+

Macro library name	Macros defined
\$255\$DUA28:[SYSLIB]STARLET.MLB;2	0

0 GETS were required to define 0 macros.
There were no errors, warnings or information messages.
MACRO/ENABLE=SUPPRESSION/DISABLE=(GLOBAL,TRACEBACK)/LIS=LIS\$:MTHCGEXP/OBJ=OBJ\$:MTHCGEXP MSRC\$:MTHJACKET/UPDATE=(ENH\$:MTHJACKET)+MSRC

0258 AH-BT13A-SE
VAX/VMS V4.0

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